

# THE ECONOMIC AND FISCAL IMPACT OF THE DEMONSTRATION FUND ON THE IOWA STATE ECONOMY



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## 1.0 INTRODUCTION AND METHODOLOGY

The Demonstration Fund is a financial assistance program offered by the Iowa Economic Development Authority to support high technology prototype and concept development activities that have a clear potential to lead to commercially viable products or services. The Demonstration Fund supports commercialization activities by small- and medium-sized companies located in the State of Iowa (the State) in the advanced manufacturing, biosciences, and information technology industries. The primary purpose of the Demonstration Fund is to help businesses with high-growth potential reach a position where they are able to attract later stage private sector funding.

These investments translate into, among other things, economic impacts within the State. To the extent that businesses remain in operation and continue to grow, they represent new economic activity and new jobs within the State. This has a spillover effect, as new economic activity supports additional State businesses and as newly employed people spend a portion of their earnings within the State. It is useful, for policy-making and evaluative purposes, to identify and quantify the economic impacts that result from the ongoing operations of these invested companies.

The purpose of this report is to quantify the economic and fiscal impact of the Demonstration Fund on the State economy. A survey of past recipients of Demonstration Fund investments was conducted by the Iowa Innovation Corporation to determine, among other things, how large these companies are now as compared to their pre-investment levels. This growth in size – in annual revenues and in head count – can be attributed in part to the involvement of and investment by the Demonstration Fund.

Furthermore, the resulting economic impact is greater than the direct increase in expenditures and head count, since those increases lead to a series of spillover effects, whereby the impact of new company spending and employee earnings ripples through local economies and supports additional economic activity and job creation. Job impact estimates are determined by using standard input-output methodologies and multipliers, as provided by the US Department of Commerce.<sup>1</sup> Specifically, Type II multipliers were obtained from the Bureau of Economic Analysis' Regional Input-Output Modeling System (RIMS II) for the State and were used to translate direct increases in expenditures and head count by industry into the total economic impacts that result from them.

Similarly, fiscal impacts – the expansion in various tax bases that result from these economic impacts – can be estimated. This enables an understanding of the Demonstration Fund's return on investment: the ongoing tax revenues generated from new firms and from firm growth, as compared to the initial investment made by the State to catalyze those new firms and firm growth.

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<sup>1</sup> See Appendix A for a summary of Econsult Solutions' economic and fiscal impact methodology.

## 2.0 INVESTMENTS BY THE DEMONSTRATION FUND AND THE AGGREGATE FIRM GROWTH THAT RESULTED FROM THEM

Between 2007 and 2012, the Demonstration Fund made 127 investments, totaling about \$13 million in investments. Thirteen firms received two awards, nine have closed, and four declined the investment, leaving a universe of 101 existing firms. Seventy-nine of them provided information via the Iowa Innovation Corporation's survey. Given that the remaining 22 firms are likely to have grown in size since their investment by the Demonstration Fund, excluding them from this analysis means that the resulting estimates of aggregate firm growth and of the economic impact that ensues from it are likely understated.<sup>2</sup>

In the aggregate, the 79 survey respondents reported head count growth of about 600 (now representing over 1,200 employees) and annual revenue growth of about \$87 million (now representing over \$160 million in annual sales) (see Table 2.1). This increase in employment and economic activity came in a wide range of industries, including construction machinery and industrial instruments manufacturing; medical device manufacturing; food products manufacturing, animal vaccines; anti-cancer therapeutics; computer system design services and software development.

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<sup>2</sup> Furthermore, four companies did not report complete pre- and post-investment head count figures, one company did not provide a NAICS code, and 19 companies did not report complete pre- and post-investment annual revenue amounts. Excluding these figures has the further effect of understating the subsequent results.

**Table 2.1 – Aggregate Growth in Employees and in Annual Revenues by Recipients of Demonstration Fund Investments between 2007 and 2012, Comparing Pre-Investment Levels with Post-Investment Levels, Sorted by Industry (Two-Digit RIMS II Industry Codes)<sup>3</sup>**

<b>RIMS II</b>	<b># Firms</b>	<b>Current Head Count</b>	<b>Δ Head Count from Pre-Investment</b>	<b>Current Annual Revenues</b>	<b>Δ Annual Revenues from Pre-Investment</b>
8	1	4	3	\$0.20	\$0.20
9	1	0	0	\$0	\$0
11	4	97.5	13	\$4.20	\$3.30
12	5	70	22	\$18.30	\$1.80
13	10	194	38	\$28.50	\$13.10
14	3	168	55	\$22.50	\$6.80
16	1	2	0	\$0	\$0
18	4	21	12	\$1.40	\$0.60
19	3	71	18	\$28.90	\$13.20
25	6	48	28	\$1.10	\$0.70
37	9	95	59	\$5.20	\$2.90
40	3	12	7	\$0.10	\$0.10
41	2	8.5	3	\$0.20	\$0.20
48	26	471	338	\$56.70	\$43.80
<b>Total</b>	<b>78</b>	<b>1,262</b>	<b>596</b>	<b>\$167.10</b>	<b>\$86.60</b>

*Source: Iowa Innovation Corporation (2012), Econsult Solutions, Inc. (2013)*

<sup>3</sup> Each company that provided a NAICS code was assigned to a RIMS II industry code based on a NAICS-to-RIMS conversion table. See Appendix B for a list of industry descriptions for each two-digit RIMS II industry code.

### 3.0 ECONOMIC IMPACT FROM AGGREGATE FIRM GROWTH

This increase in employment and economic activity has a spillover effect throughout the State economy, as new economic activity supports additional State businesses and as newly employed people spend a portion of their earnings within the State. By modeling these spillover effects, one can get a sense of the total economic impact – in the form of new expenditures, employment, and earnings – that result from the aggregate firm growth made possible in part by the Demonstration Fund.

On an annual basis, this aggregate firm growth supports a significant amount of economic activity throughout the State. It is estimated the total annual economic impact within the State is about \$150 million, supporting about 1,100 employees and about \$49 million in earnings each year (see Table 3.1). This increase in employment and economic activity comes from a wide range of industries, and in turn generates impacts in a wide range of industries, from manufacturing and agriculture to professional services and health care (see Table 3.2).

Looking ahead, it is hoped that these firms continue to grow, increasing their head count and their annual revenues. Therefore, the aggregate firm growth represented by Demonstration Fund recipients, and the annual economic impacts that result from it, are likely to increase over time beyond the economic impact estimates made in this report, all triggered by the \$13 million in initial investments made by the Demonstration Fund between 2007 and 2012.

**Table 3.1 – Estimated Annual Economic Impact within the State of Iowa Resulting from the Aggregate Growth in Employees and in Annual Revenues by Recipients of Demonstration Fund Investments between 2007 and 2012, Comparing Pre-Investment Levels with Post-Investment Levels**

	State of Iowa
Direct Expenditures (\$M)	\$87
Indirect and Induced Expenditures (\$M)	\$66
<b>Total Expenditures (\$M)</b>	<b>\$153</b>
<b>Total Employment</b>	<b>1,074</b>
<b>Total Earnings (\$M)</b>	<b>\$49</b>

Source: US Department of Commerce (2009), Iowa Innovation Corporation (2012), Econsult Solutions, Inc. (2013)

**Table 3.2 – Industry Distribution of Expenditure and Employment Impact from Aggregate Growth in Employees and in Annual Revenues by Recipients of Demonstration Fund Investments between 2007 and 2012, Comparing Pre-Investment Levels with Post-Investment Levels**

<b>Expenditure Impact within the State of Iowa</b>	<b>%</b>	<b>Employment Impact within the State of Iowa</b>	<b>%</b>
Manufacturing	33.8%	Professional, scientific, and technical services	40.9%
Professional, scientific, and technical services	30.2%	Manufacturing	20.4%
Finance and insurance	5.0%	Health care and social assistance	5.4%
Agriculture, forestry, fishing, and hunting	5.0%	Retail trade	5.2%
Real estate and rental and leasing	4.6%	Administrative and waste management services	3.3%
All other industries	21.4%	All other industries	24.9%

*Source: US Department of Commerce (2009), Iowa Innovation Corporation (2012), Econsult Solutions, Inc. (2013)*

## 4.0 FISCAL IMPACT AND RETURN ON INVESTMENT FROM AGGREGATE FIRM GROWTH

These annual economic impacts also result in commensurate increases in various state-level tax bases, thus generating additional tax revenues for the State. It is estimated that the aggregate annual tax revenue gain to the State is about \$2 million (see Table 4.1).

**Table 4.1 – Estimated Annual Fiscal Impact to the State of Iowa Resulting from Aggregate Firm Growth Made Possible in Part by Investment by the Demonstration Fund between 2007 and 2012**

State of Iowa	\$M
Income Tax Revenues (\$M)	\$1.1
Sales Tax Revenues (\$M)	\$0.9
Business Tax Revenues (\$M)	\$0.1
Total Tax Revenues (\$M)	\$2.1

Source: US Department of Commerce (2009), Iowa Department of Management (2012), Iowa Innovation Corporation (2012), Econsult Solutions, Inc. (2012, 2013)

This \$2 million fiscal impact figure must be further explained in order to understand how it can be related to the \$13 million in investments from which it is derived. It represents the current annual tax revenues generated by the increase in business activity of firms invested in by the Demonstration Fund between 2007 and 2012. It thus represents a snapshot of fiscal impact at one point in time (the present). Firms invested in by the Demonstration Fund have generated some additional tax revenues in past years, and, more importantly, they will continue to generate some additional tax revenues in future years.

Therefore, even if the Demonstration Fund does not make another investment, there will continue to be fiscal impacts from its past investments each year into the future. Furthermore, to the extent that firms invested in by the Demonstration Fund continue to grow over time in company size and business activity, the annual fiscal impact number will also grow over time.

Therefore, it is correct but incomplete to say that the annual return on the Demonstration Fund's investments between 2007 and 2012 is about 16 percent: \$13 million invested in firms produced \$2.1 million in annual tax revenues for the State. If firms invested in by the Demonstration Fund continue to grow over time in company size and business activity, the annual fiscal impact in future years will be larger than \$2.1 million and therefore the annual return on the Demonstration Fund's investments between 2007 and 2012 will be higher than 16 percent.



Furthermore, the \$2.1 million in annual tax revenues for the State only accounts for the 79 firms invested in by the Demonstration Fund that completed a survey. These 79 firms received an aggregate \$8.7 million in investments from the Demonstration Fund. The difference between this investment amount and the total investment amount is in part from firms that no longer exist and in larger part from firms that did not complete a survey. Should the annual return on investment estimate take into account only those investments in firms that completed a survey, it would not be 16 percent but rather 24 percent: \$8.7 million invested in firms produced \$2.1 million in annual tax revenues for the State (see Table 4.2).

**Table 4.2 – Estimated Annual Return on Investment to the State of Iowa from Investments by the Demonstration Fund between 2007 and 2012**

Including All \$13M Invested	Including Only the \$8.7M Invested in Firms That Completed a Survey
<b>\$2.1M Annual Fiscal Impact at Present</b> <div>÷ \$13M Invested</div> <b>= 16%</b>	<b>\$2.1M Annual Fiscal Impact at Present</b> <div>÷ \$8.7M Invested</div> <b>= 24%</b>

Source: US Department of Commerce (2009), Iowa Department of Management (2012), Iowa Innovation Corporation (2012), Econsult Solutions, Inc. (2012, 2013)

## APPENDIX A – ECONOMIC AND FISCAL IMPACT MODEL METHODOLOGY

### A.1 Economic Impact Model

The methodology and input-output model used in this economic impact analysis are considered standard for estimating such expenditure impacts, and the results are typically recognized as reasonable and plausible effects, based on the assumptions (including data) used to generate the impacts. In general, one can say that any economic activity can be described in terms of the total output generated from every dollar of direct expenditures. If an industry in a given region sells \$1 million of its goods, there is a direct infusion of \$1 million into the region. These are referred to as *direct expenditures*.

However, the economic impact on the region does not stop with that initial direct expenditure. Regional suppliers to that industry have also been called upon to increase their production to meet the needs of the industry to produce the \$1 million in goods sold. Further, suppliers of these same suppliers must also increase production to meet their increased needs as well. These are referred to as *indirect expenditures*. In addition, these direct and indirect expenditures require workers, and these workers must be paid for their labor. These wages and salaries will, in turn, be spent in part on goods and services produced locally, engendering another round of impacts. These are referred to as *induced expenditures*.

Direct expenditures are fed into a model constructed by Econsult Solutions, Inc. and based on data provided by the US Department of Commerce's Bureau of Economic Analysis through its Regional Input-Output Modeling System (RIMS II). The model then produces a calculation of the total expenditure effect on the regional economy. This total effect includes the initial direct expenditure effect, as well as the ripple effects described, the indirect and induced expenditure effects.

Part of the total expenditure effect is actually the increase in total wages and salaries (usually referred to as earnings), which the model can separate from the expenditure estimates. Direct payroll estimates are fed into the "household" industry of the input-output model. Impacts of this industry are estimated using the personal consumption expenditure breakdown of the national input-output table and are adjusted to account for regional consumption spending and leakages from personal taxes and savings. The direct, indirect, and induced earnings represent a component of the total economic impact attributable to wages and salaries. Finally, the model calculates the total expenditures affecting the various industries and translates this estimate into an estimate of the total labor (or jobs) required to produce this output.

In short, the input-output model estimates the total economic activity in a region that can be attributed to the direct demand for the goods or services of various industries. This type of approach is used to estimate the total economic activity attributable to the expenditures associated with various types of spending in the region.

## A.2 Fiscal Impact Model

The RIMS II model provides estimates of the economic impact of a new project or program on the regional economy. It does not, however, estimate the fiscal impact of the increased economic activity on state and local governments. Econsult has constructed a model that takes the output from the RIMS II model and generates detailed estimates of the increases in state and local tax collections that arise from the new project. Those revenues are in fact a part of the total economic impact of a new project that is often ignored in conventional economic impact analyses.

The RIMS II model provides estimates of direct, indirect, and induced expenditures, earnings, and employment within the defined region. The Econsult fiscal impact model combines the RIMS II output with U. S. Census Bureau County Business Patterns data to produce estimates of the distribution of additional employment and earnings by county. In addition, the 2000 Census “Journey to Work” data on commuting flows are utilized to estimate income earned by residents of each county within the region, regardless of where they work. The fiscal model can then estimate the increase in earned income taxes by county and for the state as a whole resulting from the new project.

**Figure A.1 – Glossary of Terms for Input-Output Models**

**Multiplier Effect** – the notion that initial outlays have a ripple effect on a local economy, to the extent that direct expenditures lead to indirect and induced expenditures.

**Economic Impacts** – total expenditures, employment, and earnings generated.

**Direct Expenditures** – initial outlays usually associated with the project or activity being modeled; examples: one-time upfront construction and related expenditures associated with a new or renovated facility, annual expenditures associated with ongoing facility maintenance and/or operating activity.

**Direct Employment** – the full time equivalent jobs associated with the direct expenditures.

**Direct Earnings** – the salaries and wages earned by employees and contractors as part of the direct expenditures.

**Indirect Expenditures** – indirect and induced outlays resulting from the direct expenditures; examples: vendors increasing production to meet new demand associated with the direct expenditures, workers spending direct earnings on various purchases within the local economy.

**Indirect Employment** – the full time equivalent jobs associated with the indirect expenditures.

**Indirect Earnings** – the salaries and wages earned by employees and contractors as part of the indirect expenditures.

**Total Expenditures** – the sum total of direct expenditures and indirect expenditures.

**Total Employment** – the sum total of direct employment and indirect employment.

**Total Earnings** – the sum total of direct earnings and indirect earnings.

*Source: Econsult Solutions, Inc. (2013)*



## APPENDIX B— RIMS II INDUSTRY CODES

### **Agriculture, forestry, fishing, and hunting**

- 1 Crop and animal production
- 2 Forestry, fishing, and related activities

### **Mining**

- 3 Oil and gas extraction
- 4 Mining, except oil and gas
- 5 Support activities for mining

### **Utilities**

- 6 Utilities

### **Construction**

- 7 Construction

### **Manufacturing**

- 8 Wood product manufacturing
- 9 Nonmetallic mineral product manufacturing
- 10 Primary metal manufacturing
- 11 Fabricated metal product manufacturing
- 12 Machinery manufacturing
- 13 Computer and electronic product manufacturing
- 14 Electrical equipment and appliance manufacturing
- 15 Motor vehicle, body, trailer, and parts manufacturing
- 16 Other transportation equipment manufacturing
- 17 Furniture and related product manufacturing
- 18 Miscellaneous manufacturing
- 19 Food, beverage, and tobacco product manufacturing
- 20 Textile and textile product mills
- 21 Apparel, leather, and allied product manufacturing
- 22 Paper manufacturing
- 23 Printing and related support activities
- 24 Petroleum and coal products manufacturing
- 25 Chemical manufacturing
- 26 Plastics and rubber products manufacturing



**Wholesale trade**

27 Wholesale trade

**Retail trade**

28 Retail trade

**Transportation and warehousing**

29 Air transportation

30 Rail transportation

31 Water transportation

32 Truck transportation

33 Transit and ground passenger transportation

34 Pipeline transportation

35 Other transportation and support activities

36 Warehousing and storage

**Information**

37 Publishing industries, except Internet

38 Motion picture and sound recording industries

39 Broadcasting, except Internet

40 Telecommunications

41 Internet and other information services

**Finance and insurance**

42 Federal Reserve banks, credit intermediation and related services

43 Securities, commodity contracts, investments.

44 Insurance carriers and related activities

45 Funds, trusts, and other financial vehicles

**Real estate and rental and leasing**

46 Real estate

47 Rental and leasing services and lessors of intangible assets

**Professional, scientific, and technical services**

48 Professional, scientific, and technical services

**Management of companies and enterprises**

49 Management of companies and enterprises



**Administrative and waste management services**

50 Administrative and support services

51 Waste management and remediation services

**Educational services**

52 Educational services

**Health care and social assistance**

53 Ambulatory health care services

54 Hospitals

55 Nursing and residential care facilities

56 Social assistance

**Arts, entertainment, and recreation**

57 Performing arts, spectator sports, museums, zoos, and parks

58 Amusements, gambling, and recreation

**Accommodation and food services**

59 Accommodation

60 Food services and drinking places

**Other services**

61 Other services

**Households**

62 Households

## APPENDIX C— ABOUT ECONSULT SOLUTIONS, INC.

Econsult Solutions Inc. provides businesses and public policy makers with economic consulting services in urban economics, real estate economics, transportation, public infrastructure, development, public policy and finance, community and neighborhood development, planning, as well as litigation support.

Econsult Solutions has the capability to engage in projects of any size, from comprehensive long-term studies involving complicated economic arguments and extensive data analysis, to short-term advisory support. Whether working independently or on joint-venture projects, our flexibility and customized approach allow us to respond to a vast range of client needs.

Our scope is large, and our expertise specific. Econsult assists clients in the evaluation of economic and fiscal outcomes of programs and developments, offers city and regional planning insight and advice, provides GIS analytic services, yields financial projections and advises investors and governments on projects, developments, and policy outcomes, and has the economic skills and expertise to process, analyze and manage large and complex datasets.

Our Principals and Senior Advisors include nationally recognized experts in urban development, real estate, government and public policy, planning, transportation, non-profit management, business strategy and administration, as well as litigation and commercial damages. Staff members have outstanding credentials, including active positions at the university level, wide experience at the highest levels of the public policy process and extensive consulting experience.

